WILDLIFE
in North Carolina

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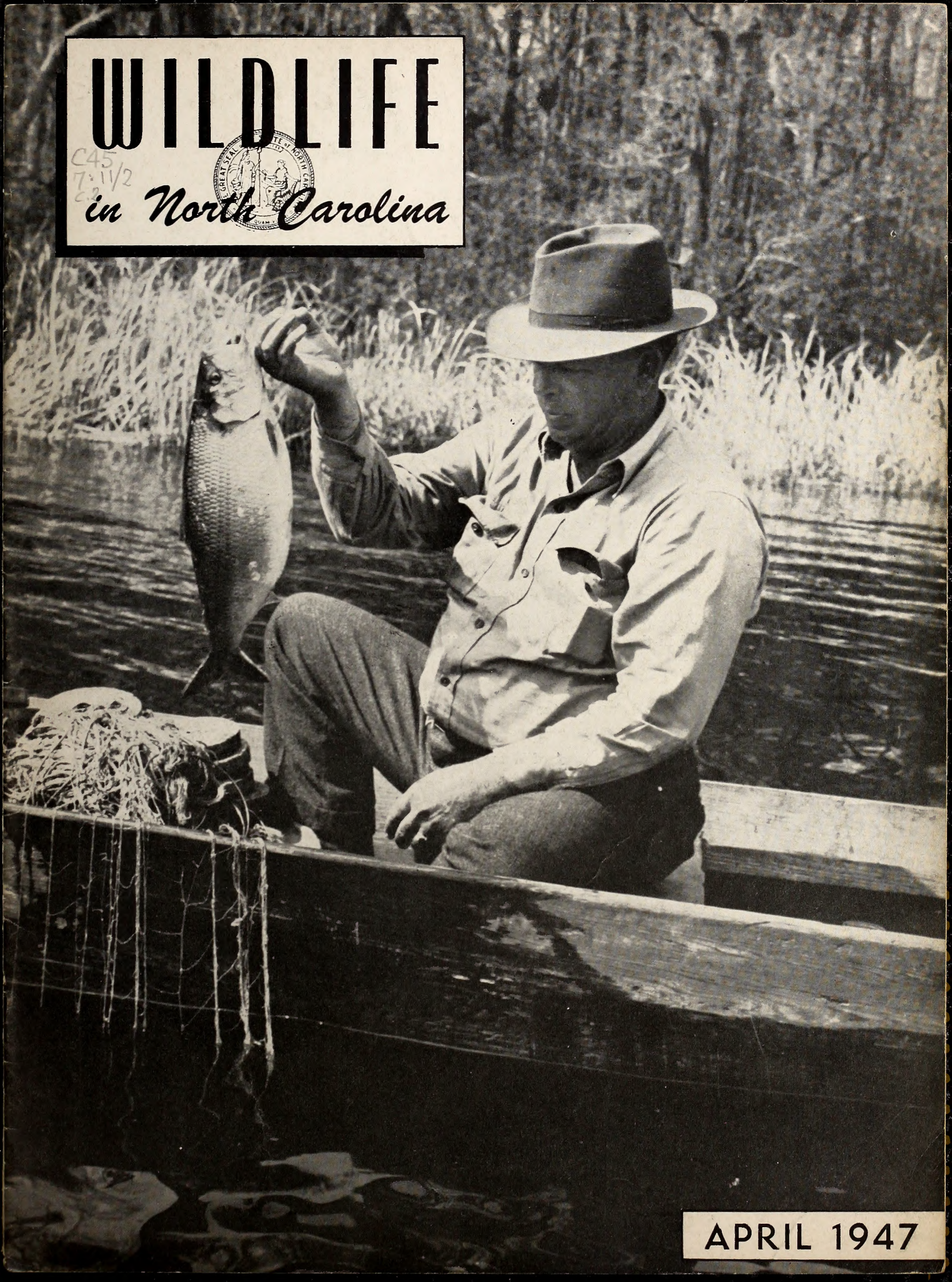

APRIL 1947

R. Bruce Etheridge

This issue of WILDLIFE IN NORTH CAROLINA is dedicated to R. Bruce Etheridge, Director of the Department of Conservation and Development.

"Uncle Bruce," as he is so affectionately known throughout the State, has been at the helm as Director of this Department since 1933.

Great progress has been made during the 14-year period 1933-1947 in the conservation and development of the resources of North Carolina and every citizen of the State should recognize the part Bruce Etheridge has played in the expansion of the functions of this Department during that period.

Game and fresh-water fisheries interests will be removed from the Department of Conservation and Development effective July 1, 1947 and in dedicating this issue of WILDLIFE IN NORTH CAROLINA to the Director, we are attempting in a small way to pay tribute to a man whom we all love and admire.

Wildlife in North Carolina

A quarterly magazine devoted to the protection and restoration of our wildlife resources and to the improvement of hunting and fishing in North Carolina.

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Wildlife In North Carolina is published quarterly at Raleigh, N. C. by the North Carolina Division of Game and Inland Fisheries. Subscription: 50c per year; 15c each.

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COVER

Netting for shad in the lower Northeast Cape Fear River, Mr. E. C. Highsmith of Rocky Point, N. C., displays a fine roe shad taken from his drift gill net. The nets are fished on the change of the tide, drifting only a few hundred yards before the tide eddies and the nets are withdrawn. The Northeast Cape Fear River is designated Commercial Fishing Waters below Highway No. 53 bridge, Inland Waters above that bridge. The roe shad is a real delicacy as most eastern North Carolinians will agree.

T. H. WALKER
Editor

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Fishing Season at Hand

This is the first year that North Carolina has had no State-wide closed season on fishing for warm-water fishes. In recent years several large lakes and waters have been open to year-round fishing and the experience gained prompted the Board of Conservation and Development to remove the closed season throughout the State. A few streams in the State will be closed for a 60-day period in May and June to conserve spawning fish, particularly small-mouth bass in the west, and bluegills and robin in the east. These streams will be posted and announced in local papers.

The season for trout fishing in western North Carolina remains as it was in past years. It will open April 15 and extend through August 31. Trout caught in public lakes, where warm-water fish dominate the lake, may be kept throughout the year. The season and open dates for fishing in the coöperative wildlife management areas and in Great Smoky Mountains National Park have not been announced, but probably will be similar to the 1946 schedule.

Trout distribution lists have been forwarded to the Hatchery Superintendents and stocking of trout into public streams has been underway several weeks.

In the east, shad and herring fishing is getting the most attention. Fishing for these fishes is permitted in inland waters Thursday, Friday, and Saturday of each week from March 1 to May 1. The season in the Neuse and Tar Rivers is April 1 to June 15. The fish are taken with gill nets of various types, and with skim or dip nets. All fishing gear of this type requires a special license which can be obtained from any of the Division's Fish and Game Protectors. A tag is provided with the license for attachment to the fishing gear. There are no size limits or creel limits, but the waters where fishing is authorized are given in the Division's handbook. Not all waters used by shad and herring are opened to fishing. It is recognized that these fishes spawn in the inland waters, and that if their numbers are to be conserved fishing must be restricted. The catch in commercial waters as well as in fresh waters is dependent on successful spawning.

Pole and line, rod and real fishing for bass, crappies and Jack will be at its best in late spring and early summer. The fish are active and are feeding in shallow water at that time. Contrary to popular opinion, spawning largemouths usually spurn a lure and are difficult to catch at that season. Reports have come to the Division's offices at Raleigh to the effect that the bass in Currituck Sound are running larger and more numerous than last year. It is hoped that anglers will find the harvest there plentiful.

Fishing regulations have been reduced to a minimum in North Carolina. It has been found that better public coöperation can be obtained with the fewest possible restrictions. Fish are a crop which can be harvested as available. Depletion of brood stock is difficult to accomplish by pole and line fishing. Decline of fishing in any type of water can usually be traced to other factors.

Get the old tackle box and all fishing gear ready. The season for the best fishing is at hand.

DON'T FORGET PERIOD OF FISHING LICENSES

While you're thinking about the fishing season at hand, don't forget to check your license along with your equipment. North Carolina's fishing license terms run by the calendar year—January 1 to December 31. If you buy only a fishing license, be sure you have the 1947 variety. If you're a hunter and fishermen and got a combination license last fall, you're okay, of course. Combination licenses bought for the 1946-47 season are valid through July of this year.

The wild goose has about 12,000 muscles, 10,000 of which control the action of its feathers.

A nice string of black crappie taken from Lake Waccamaw on May 14, 1946. The fish were taken on live minnows, the boat allowed to drift along the "bonnet" beds and before the mouths of creeks. The string of 25 averaged about one pound per fish, and were one evening's catch by two fishermen.

Wildlife Resources Commission

Transfer of Division's Functions to New Agency Effective July 1, 1947

North Carolina game and inland fisheries administration, a function of the Department of Conservation and Development since its creation and since passage of the first State-wide game law 20 years ago, goes independent on July 1, under a new agency—the Wildlife Resources Commission.

The Commission will be made up of nine members — one each from nine districts established by the Wildlife Resources Act — appointed by the Governor. The Commission will appoint an Executive Director as its chief administrative officer. Its first meeting is set by law for July 1, in Raleigh.

Original appointments to the Commission will be: three members for two years, three for four years, and three for six years, to set up staggered terms. After the original terms expire, appointments will be for six years.

Abolition of the Division of Game and Inland Fisheries of the Department and transfer of the Division's functions to an agency to be known as the Wildlife Resources Commission were voted last month by the General Assembly, to become effective July 1, 1947. Only a scattering of dissent was heard as each chamber adopted the proposal on a voice vote. The bill first was adopted by the House on February 20; passed by the Senate, with several amendments, on March 4; and approved by the House finally, as amended by the Senate, on March 6.

The "separation" measure, sponsored by the North Carolina Wildlife Federation in an intensive State-wide campaign following defeat of a similar proposal in the 1945 Assembly, was quickly labeled for success at the 1947 session. Prior to introduction of twin bills in the House and Senate calling for creation of the Commission and giving to it fish and game administration, advocates obtained the signatures of 70 Representatives — nine more than a House majority — and of 17 Senators — only nine short of a Senate majority — as co-introducers.

The bill drafted by the Federation did not ride through in the original, however. A major change fused into the measure before it became law deals with the length of terms of Commission members. There also were several clarifying amendments.

Adoption of the amendment regarding the terms of Commission members ripped an important plank out of the platform on which advocates stood during their campaign for a separate agency. The expressed major objective of the Federation was to assure continuity of program through a system of Commission terms so arranged that after the first appointments, no Governor would be able to appoint a majority of the members. The bill as introduced would have set up nine-year terms (after the original terms set by law to establish staggering), with one to expire each year, so that nomally only four vacancies would occur during a Governor's term in office.

This section ran into strong opposition in the Senate Committee on Conservation and Development, which took up the bill following its passage in the House. After several Senators expressed opposition to nine-year terms as too long and as against North Carolina general policy, the Committee adopted, by a vote of 12 to 11 (the chairman breaking a tie), the amendment calling for six-year terms. This means that each Governor will have at least six appointments. No dissent was expressed in the Senate when this amendment came up for action, nor in the House when the bill went back to the lower chamber for concurrence in the Senate changes.

Here, in summary, are the major provisions of the Wildlife Resources Law:

Definitions. The terms "Wildlife Resources" and "Wildlife" shall mean and include game birds and other game animals, game and fresh-water fishes, fur-bearing animals, song and insect-eating birds, non-game mammals and birds, and all other naturally wild aquatic and terrestrial animals, except those species of fish and other wild aquatic animals which shall come under the classification of Commercial Fisheries.

Statement of Purpose. The purpose of this Act is to create a separate State agency to be known as the North Carolina Wildlife Resources Commission, the function, purpose, and duty of which shall be to manage, restore, develop, cultivate, conserve, protect, and regulate the wildlife resources of the State of North Carolina, and to administer the laws relating to game, game and fresh-water fishes, and other wildlife exclusive of Commercial Fisheries, enacted by the General Assembly to the end that there may be provided a sound, constructive, comprehensive, continuing, and economical game, game fish, and wildlife program directed by qualified competent, and representative citizens, who shall have knowledge of or training in the protection, restoration, proper use, and management of wildlife resources.

Creation of Wildlife Resources Commission. There is hereby created a commission to be known as the North Carolina Wildlife Resources Commission. The Commission shall consist of nine citizens of North Carolina, who shall be competent and qualified as herein provided, and who shall be appointed by the Governor. One and only one of the Commission members shall be appointed from each of the following geographical districts:

First District — Bertie, Camden, Chowan, Currituck, Dare, Gates, Hertford, Hyde, Martin, Pasquotank, Perquimans, Tyrrell, and Washington counties.

Second District — Beaufort, Carteret, Craven, Duplin, Greene, Jones, Lenoir, Onslow, Pamlico, Pender, and Pitt counties.

Third District — Edgecombe, Franklin, Halifax, Johnston, Nash, Northampton, Vance, Wake,

(*Continued on page seventeen*)

Some Basic Ideas Relating To Farm Game Restoration

By Dennis Hart

The Division of Game and Inland Fisheries receives many letters from people of the State requesting information, advice, and assistance with regard to increasing the numbers of quail and other farm game species on particular areas of land on which they like to hunt. This statement is designed to give information in a general way on the subject of these letters. While written primarily in terms of quail management, this statement refers generally to various species of farm game. It should be of interest generally to sportsmen of North Carolina.

In the past, we have all more or less assumed that when quail, for example, become too few the best way to restore them was to obtain birds from game farms and release these on the areas over which we expected to hunt. Now, however, as the result of considerable practical field investigation of this matter, we know that this artificial restocking is never adequate in itself, may be entirely unnecessary, and may do more harm than good.

If quail have decreased in numbers, it is because of one or two things, or both. Either too many hunters have been after these birds and have taken a greater part of the annual brood than usual, or the feed, cover, and predation conditions have become abnormally bad, or, as usually is the case, both of these circumstances have come into existence.

Obviously, the release of pen-reared quail will not help the situation if feed and cover conditions are not adequate. If these habitat conditions are satisfactory, then whatever quail are already on the area will repopulate it fully. Artificial stocking is effective generally in only two kinds of circumstances:

1. In areas where quail have been completely shot out and breeding stock cannot move in of its own accord, it is necessary to bring in and release breeding stock.

2. Quite frequently quail range can support more quail during the spring, summer, and fall than have been able to survive on the area during the preceding winter. Quail can be released on such areas during the spring, summer, and fall as a means of providing a greater number of quail for shooting during the next following fall season.

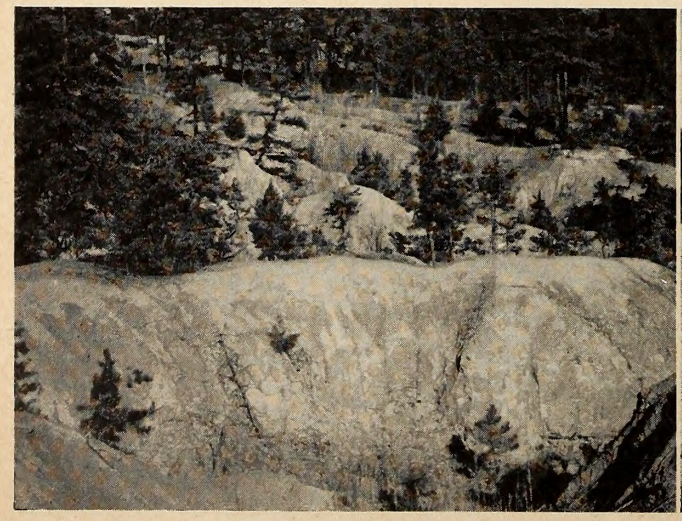
It is obvious, however, that in both of these instances of restocking, the feed and cover conditions on the land must first be made very favorable. In the number two instance, especially when stocking is being done for immediate shooting without allowing time for the new stock to raise a crop of young, it is likely to be too costly for any but clubs and individuals with considerable means for the purpose.

Quail from Mexico and other far-south regions should not be stocked in North Carolina, because they are smaller, cannot survive the relatively rigorous conditions this far north, and are inferior in sporting qualities.

In restocking with pen-reared quail only very healthy stock should be used. Even though healthy, pen-raised quail which are the result of many generations of selective breeding in captivity will certainly have lost some of the qualities of "gameness" and hardiness that are normal to the species. Poultry was by that very process developed from wild game birds. Artificial restocking with pen-raised quail, then, requires the most careful selection of breeding stock and rearing and release of the young. Otherwise it will be a waste of money. Some pen-reared stock is ridden with diseases and parasites. In such cases and where the stock is inferior, considerable harm may be done by artificial restocking.

For the bringing about of better hunting, we must place our

(Continued on page fifteen)



This sore that is eating away a whole farm (left) could be stopped by the establishment of plants that would also provide feed and cover for game. Right, this untillable bit of land has been planted to soil- and water-holding plants that also provide good habitat for game.

Game Management Affects

The Raccoon

By William Hamnett

Daniel Boone wore a coonskin cap, which soon became the badge of a frontiersman. College students, in the past, were easily recognized by the fad which swept the campuses of wearing raccoon coats. These are of interest to us because North Carolina made major contributions to both. But what about the life of this fur-bearer so well known and exciting to us of the present generation!

The raccoon (*Procyon lotor*), kin to the bear, is a middle-sized animal having on each foot five well developed toes with fixed claws, the pads of the foot naked, the hind foot plantigrade or flat on the ground, pointed nose and ears, and a tail rather long, bushy and usually ringed.

The raccoon measures about 30 inches in total length and the tail vertebrae makes up about one-third of the length. The hind foot is 4.5 inches long. His adult weight averages 15 pounds but may range up to 49 pounds. One raccoon reported from Wake County by Cooper Young weighed 18½ pounds, and he claims it to be the largest he has ever seen.

In general color pattern, the coon is a dull brownish-gray, becoming yellower on the back, strongly yellow on the neck and on the tail, and a paler gray on the belly and feet. On the upper parts all the long hairs are black-tipped, and on the under parts they are white-tipped. It has a black mask of hairs on the cheek that includes the eyes. The combination of the following characters, robust form ringed tail, and black mask across the eyes is found in no other North Carolina animal. The sexes are alike in color.

The raccoon is an animal of woodland edges, preferably hardwoods. Dense growths of pine trees are not favored habitat for raccoons as they seek out hollow hardwoods for dens. The ideal den of this creature is some hollow branch high up in a large tree that is fully exposed to the sun. The den is not only the nursery; it is the year-round home of the family. No matter what its daytime residence is, its nightly prowling is always close to water. There are few streams in our State that are not visited by the raccoon.

He is a night prowler at all times and has a great amount of curiosity that gets him into no end of trouble. Any bright object, like shining metal, will cause him to stop and investigate; and the persons engaged in hunting it make good use of this habit. Another of its peculiarities is the fact that if it comes across a hollow log in its travels, it will always run along it from end to end. When forced to it, he is a very good swimmer and probably will play about in the water.

The raccon is quite omnivorous. Frogs, crayfish, flesh, fowl, eggs, reptiles, insects, shellfish, fruit, nuts, grains, vegetables, and sweets are acceptable fare with him; not equally so, but welcome at all times. His fondness for green corn has brought him into danger from unfriendly farmers. But this much is known, if a coon begins to eat the green corn in the field, then is the time to bring some corn home to eat, for the raccoon only seems to take corn at this time when it is soft, tender, and juicy.

Summing up its dietary, there is nothing in it, except occasional thefts of corn and fowl, to blacklist this creature on the farm book; and these little sins are so completely offset by its usefulness as a fur-bearer and beast of the chase that most persons are glad to hear that the coon is increasing in numbers in North Carolina.

It has not been definitely established that a raccoon will wash his food before eating it. There is evidence that could be cited to show that he "does" and that he "does not" wash the food.

The raccoon is a monogamous animal. The mating takes place in mid-winter and the gestation period is 60-63 days. The young are born in April or early May, and they number from three to six, four being usual. The bringing up of the family is left entirely to the mother. She teaches them how to feed along streams,

(*Continued on page eighteen*)

Fisheries Biologists at work. Dr. R. W. Eschmeyer, TVA, right foreground, his crew and biologists from the N. C. Division of Game and Inland Fisheries examine the fishes found in a small cove of Hiwassee Reservoir, October 2, 1946. Approximately three acres of water were found to be supporting about 150 pounds of fish. These were distributed as to kinds: redhorse suckers, 50; gizzard shad, 50; black crappie, 2; smallmouth bass, 2 adults and 25 fingerlings; largemouth bass, 1 adult and 50 fingerlings; bluegills, 1 adult and several hundred small fingerlings.

The Most Fish

By Nelson Marshall

Reprinted and adapted from an article by the same title by Dr. Marshall in "Florida Outdoors," November 1946. Dr. Marshall is a member of the Department of Zoology of the University of North Carolina.

An explanation of how optimum-fishing is to be sought may be introduced by considering cattle-raising practices, a bit far afield perhaps, but with similar basic biological relationships. Beef growers do not maintain fodder for mere sustenance herds of old cattle which consume with little gain in weight. They sell adults, keeping just enough for breeding purposes, and thus save grass and fodder for their rapidly growing younger cattle. Similarly, in fisheries we can hope for an optimum catch only when we have learned what quantity of breeding fish should be protected and just how intensively the remainder of the population should be fished if we are to profit most by its growth and all this, of course, calls for continued scientific investigations of the fishes in question comprehensive enough to grasp the biological relationships involved.

We see then that the simple you - can't - have - your - cake - and - eat - it conservation philosophy is fundamentally in error. Further thought reveals other ways in which we are prone to err in spite of the best intentions. For example, there is the misleading viewpoint acquired by thinking of other life forms as though they were human beings. At the rate of two to three children per couple, human populations tend to become relative stable, the numbers in one generation being very dependent upon and similar to the numbers in the preceding generation. But what about the bass, the mackerel, the lobster, bluegill, shrimp, menhaden, and so on? In one breeding season a female produces eggs by the thousands, as anyone can see by looking under the tail of an egg-bearing lobster or by glancing at the roe while cleaning a fish taken during the spawning season. Obviously, if a fair percentage of the eggs from relatively few females unite with the sperm from males, there will be vast numbers of good eggs as candidates for development and growth in our seas and fresh waters.

This production of eggs, obvi-

ously far in excess of possible survival, is simply nature's protection against extinction when breeding populations are low and adverse conditions prevail. It is pronounced in the vast majority of animals because, unlike ourselves, most animals offer little parental care and other safeguards for their vulnerable early stages.

Here are some interesting angles of these high egg numbers as found almost universally among fisheries animals. It may seem paradoxical that hatcheries, once unquestioned as aids to fish production, have often been disappointing. Hatchery efforts add great quantities of newly hatched larvae and fry to aquatic environments but these may be present already in excessive numbers.

As a result of similar findings, many hatcheries have either closed down or, with additional facilities, have been serving as rearing ponds. Such rearing of fish is comparatively costly but it is useful in supplying fish to stock newly impounded waters or to be planted in and quickly fished out of ("put and take trout fishing") waters which cannot support a fish population adequate for the highly intensified sport fishing along small streams.

Eggs produced in great numbers and ordinarily subject to severely high mortality may occasionally meet with favorable environmental conditions, optimum temperatures, decreased predation, etc., such that an unusual number will pull through. The survivors of such a year will dominate the population to the extent that, should we find two-year-olds predominating in a given year, we would find three-, four-, five-year-olds predominating in the population of this species in successive years, until the dominant year-class faded out due to mortality. Certainly we should be well aware of this phenomenon, also of the reverse situation resulting in poor, almost nonexistent, year-classes. Continued studies of fish populations are needed if we are to evaluate the resulting ups and downs which in one year may lead to over-optimism and a few years later to undue alarm.

To sum up these points, I will cite E. S. Russell, the director of Fishery Investigations for England, who makes the following generalization: ". . . there is no necessary connection between the number of eggs produced in a particular spawning season and the amount of fry which survives; on the contrary, poor spawning years have often been good brood years."

We see then that our concern as to sufficient breeding fish can be exaggerated and that we should put greater emphasis on seeking such conditions as will bring about the maximum *survival* of eggs and will result in the greatest number of young, the rapid growth of which is so advantageous to us. Eliminating toxic wastes, often from industrial sources, and promoting certain stream, lake, water control, and other habitat improvements all aid these aims. Cautious control of predators and competitors is helpful. In a few cases we have rather specialized tricks of the trade that will enhance survival of the very early stages; for example, shucked oyster shells are dumped overboard on favorable grounds to increase the quantities of old shell needed for the setting of larval oysters. Adding fertilizer to small bodies of water, including marine embayments, is a helpful measure giving good results when properly managed. The fertilizer does its work by supplying nutrients for the minute living things, which, directly or indirectly, serve as food for fish and other higher forms. Actually, human sewage has essentially the same beneficial fertilizing effect when it is dilute enough so that bacterial decay does not produce toxins and result in depletion of much-needed oxygen. We cannot speak in favor of such pollution, however, for without eliminating it we retain a menace to health and lose certain esthetic values in nature.

A very important obstacle to the survival of eggs and young is, believe it or not, *overcrowding* with a heavy population checking the development of subsequent broods. In an overcrowded situation starvation and cannibalism may be rather marked. Bony fishes, however, have a variable growth such that, instead of dying, large numbers may survive at a reduced rate of growth when faced with competition and food shortages. From fresh-water studies we find so many examples of this that I am tempted, for illustrative simplicity, to say we can almost choose by management methods between such combinations as 1,000 two-pound fish and 2,000 one-pound fish.

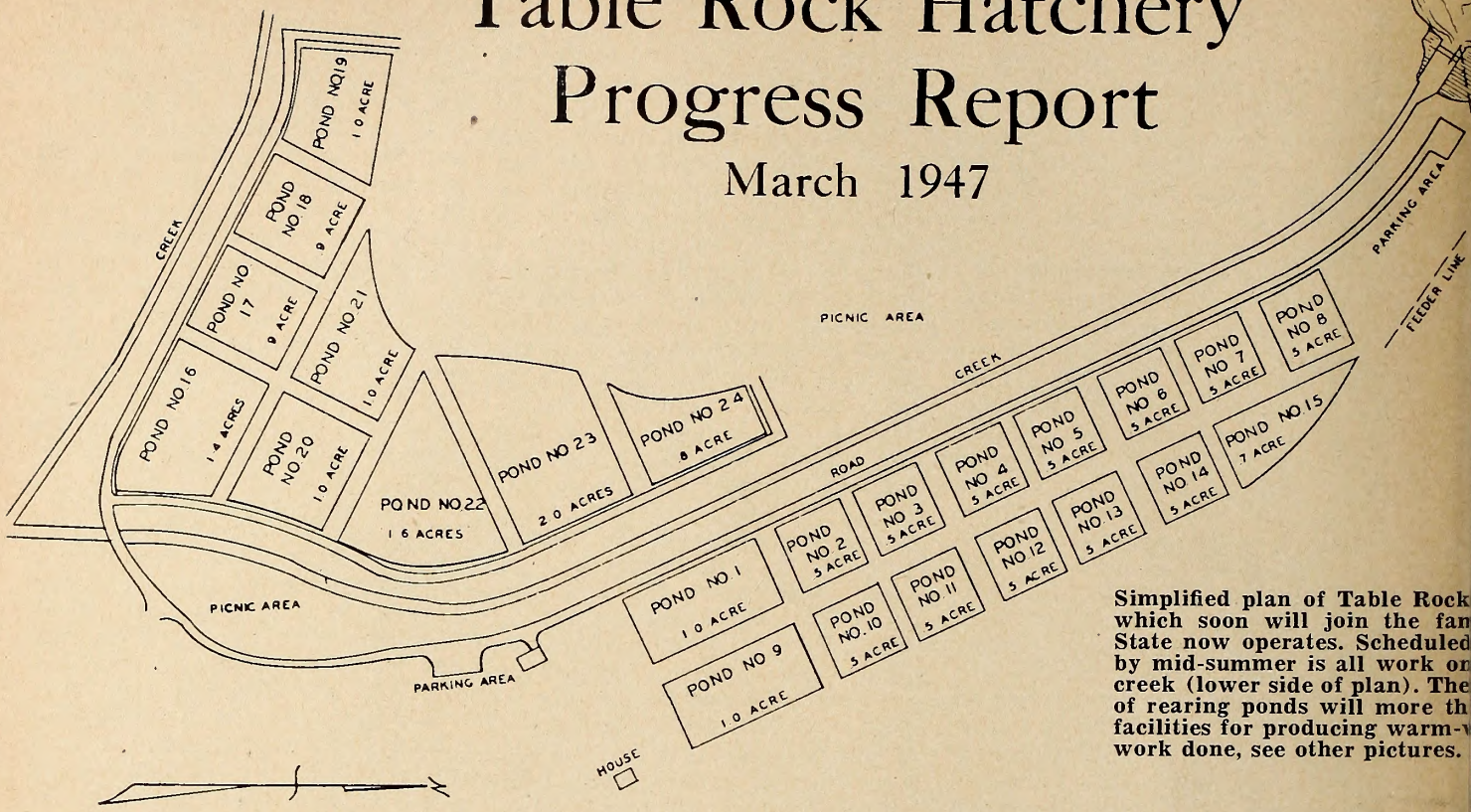
We can see then that to prevent overcrowding and encourage survival and rapid growth it is beneficial to thin out both the small and the large specimens of the population far more than is popularly realized. Aware of this, we are not so surprised when leading fisheries biologists, such as T. H. Langlois, director of the F. T. Stone Laboratory of Ohio State University, and R. W. Eschmeyer of the Tennessee Valley Authority, make statements to the effect that they are seriously concerned with *underfishing* problems.

Now let us put a few things together and think of that maximum yield which should be the ultimate objective of all conservationists. If we have a light fishing intensity with the catch greatly exceeded by natural mortality, we are wasting fish that could have entered in the human economic and recreational pattern, and certainly there is no appreciable thinning such as might enhance survival chances and stimulate the growth of younger forms. Should this fishery increase in intensity, the initial catches of the previously *unused* stock would be high. Unfortunately we repeatedly make the mistake of expecting such initial catches to be maintained, whereas after a while a point will be reached at which the yield will depend on the new recruits growing to supply the catch. If the new fishing intensity is too great, especially if the smaller individuals are not partially protected, there will be little chance for the new recruits to grow and maintain a high yield. If not intense enough, we will still be forfeiting part of our resource to natural mortality and may still be writing off a loss because of overcrowding and resulting competition. The optimum fishing intensity is somewhere in between. To find it is a complex problem to be worked out through extensive investigations of the biology and ecology of the fishes involved.

These are some of the points fisheries biologists have in mind as they approach their work whether the problems involve sports fish, commercial fish or both. It is important to convey them to you because an intelligent conservation program depends on you who are interested.

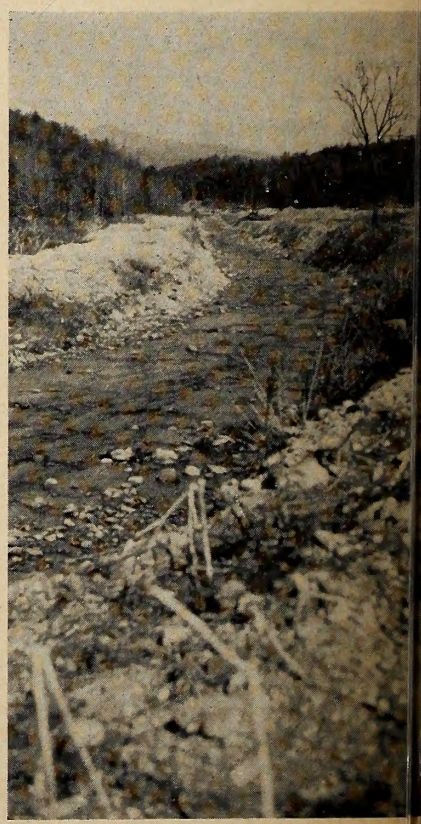
Table Rock Hatchery Progress Report

March 1947

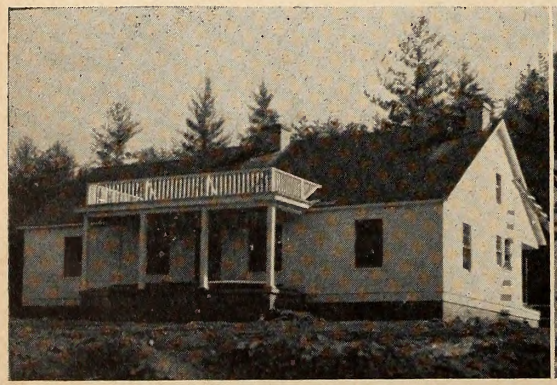


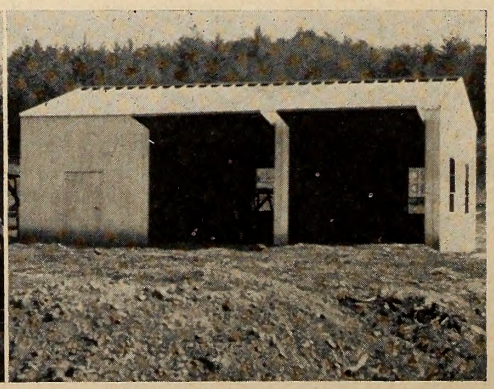
Simplified plan of Table Rock which soon will join the fan State now operates. Scheduled by mid-summer is all work on creek (lower side of plan). The of rearing ponds will more th facilities for producing warm-w work done, see other pictures.

Laying the pipe line from lake to flume line for supplying ponds. It is 644 feet long, of cast-iron water pipe 24 inches in diameter.



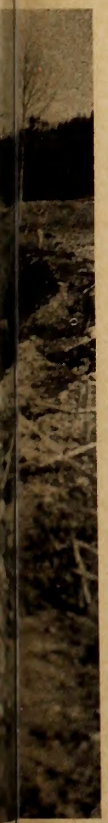
Operation Table Rock included tr ening of Irish Creek along the li ponds. This is the new channel r bed, looking north. It is 30 feet wi 6 feet deep, and 3,186 feet long. pp mately 23,000 cubic yards of e have now been completed.



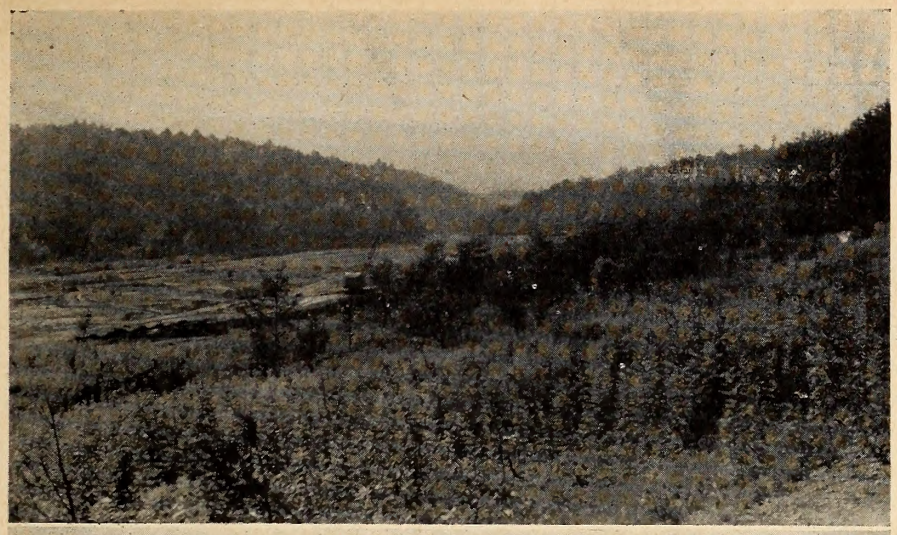


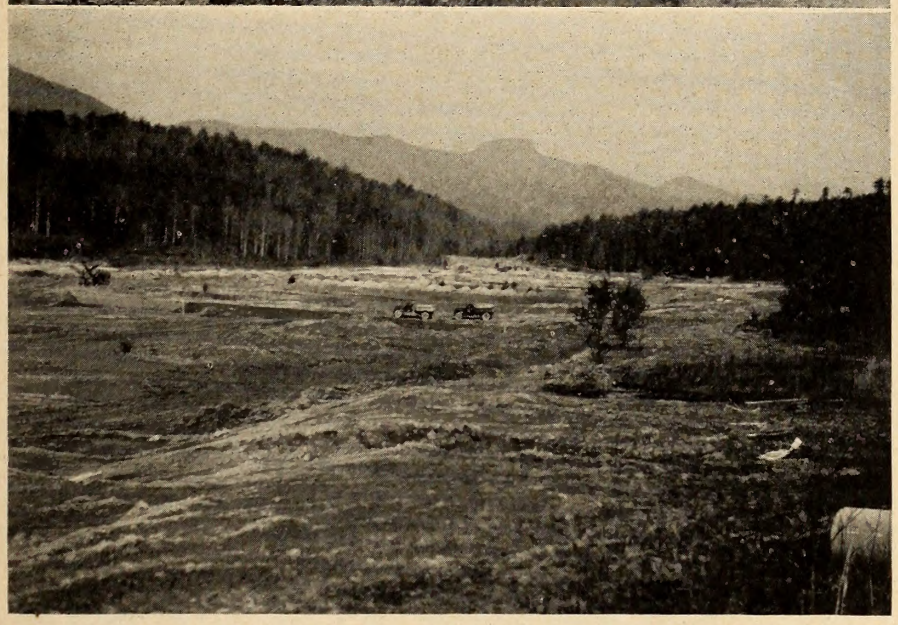
Six-room dwelling for superintendent and two-car garage and storage room.

sh Hatchery, of five the r completion stern side of ant's 20 acres double State er fishes. For

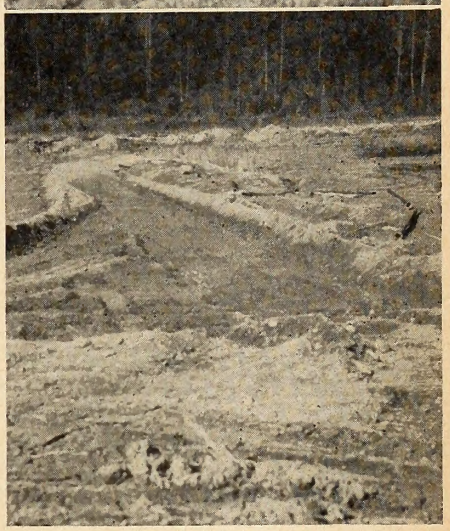


aight- of the creek , 4 to proxi- vation

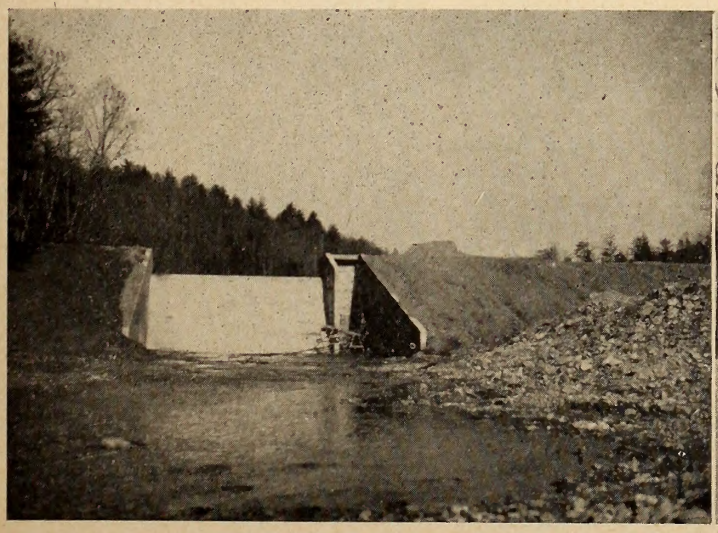


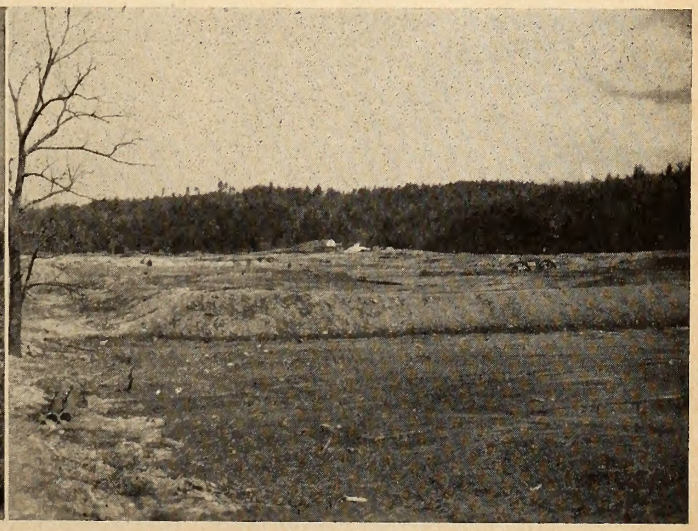


"Before and after" in Irish Creek Valley. The picture at top was made at the start of work; the one below on March 17 this year.



Pond dykes will be waterproofed by key ways (top), cut 6 to 12 feet deep, backfilled with clay (below). Now, 3,400 linear feet of key ways have been excavated. About 8,500 yards of backfill are required for ponds on east side of creek.





View from downstream (left) of the dam which will impound the hatchery water supply. It is of the earth-fill type, with a concrete core and concrete spillway. The spillway is 36 feet long, with a 5-foot freeboard and with a 60"x 60" flood gate. Crest of the spillway is 17 feet high. The lake impounded by the dam will cover 6 acres; maximum depth will be 17 feet. At right, clay dyke for Pond No. 1.

A Program for the Black Duck

By IRA N. GABRIELSON

The black duck, reputedly the wisest and wariest of the duck tribe, is slowly and steadily decreasing in numbers. The decrease has been accelerated in the past two years, and this grand sporting bird today is in the most precarious position it has ever occupied.

What is the trouble?

Surveys made by both the Fish and Wildlife Service and Ducks Unlimited in the maritime provinces of Canada have shown that the northern breeding ground is relatively undisturbed. There is no evidence that destruction of northern breeding habitat has been an important factor in the decrease. The answer lies in this country and can be stated briefly as more hunters and less suitable habitat.

Suitable breeding habitat has been seriously reduced within the United States. Likewise, food production on wintering grounds and feeding grounds has been greatly reduced by drainage for agricultural purposes, pollution of estuaries of streams badly enough to destroy the best vegetation forming duck living quarters, silting caused by excessive erosion with consequent dumping of greatly increased quantities of sediment into streams and lakes, filling of marshes for industrial and other human use, and complete destruction of good marshland by poorly engineered pest mosquito projects without doing any good in controlling the pest mosquito. Destruction of eel grass also helped decrease food production, it being the only such loss not caused by human actions.

With reduction of the total quantity of food produced, the population of waterfowl that can be sustained must go down. It has gone down. The black duck has gone with it. Food limitations on the numbers of any species operate during the period when food supplies are scantiest, and with most migratory birds and with all migratory waterfowl, that critical time comes in the winter and early spring in at least three years out of four.

This is the condition on the Atlantic coast today, and assuming that the kill of any species is held below the annual crop produced, the only known method for permanently building up Atlantic coast waterfowl is restoration to full food production of as much marshland as possible and creation of new marshes wherever economically feasible. Additional marsh or better marsh on all areas all along the coast and at any available spots inland would be especially valuable for the black duck.

This great game bird breeds from the Great Lakes north and east through the Canadian provinces, in Newfoundland, and in the lake states, New England states, and south along the Atlantic coast to North Carolina. It winters from Nova Scotia to the Gulf along the eastern coast and from the Ohio to the Gulf in the interior. The greatest winter concentrations are along the Atlantic coast from Maine to the Carolinas, with the winter population concentrated from Long Island to the Carolinas.

The Great Lakes and interior birds seem to be doing quite well, and there has been some building up of this group of black ducks during the last ten years. The contrary has been true on the Atlantic coast. The tendency has been downward, and each year the chance of rebuilding this population grows less.

It is time to do something about it. Many individuals and agencies are aware of the immediate importance of a restoration program for the black duck. The recent formation of a Joint Black Duck Committee is a concrete example of their concern. At a meeting called by Ducks Unlimited and participated in by representatives of a number of state conservation departments, the Fish and Wildlife Service, and the Wildlife Management Institute, the committee was formed with the primary purpose of providing more widely distributed food supplies for the black duck, the most important game duck breeding in the Atlantic Coast Flyway.

Greatest opportunity to help this species lies in and adjacent to the coastal marshes from Maine to Carolina, its principal breeding and wintering range. Any sound improvement in habitat in this area will immediately help — first, a local breeding population by increasing breeding opportunities; second, a migrant population that will use the habitat in spring and fall, and third, a wintering population.

The Fish and Wildlife Service has been engaged for years in increasing habitat in this critical coastal strip and to a less extent inland. Units scattered from Maine to Georgia have, to the extent that they were impoved before the war stopped all development work, contributed to the well-being not only of the black duck but to other species as well. They can contribute much more when the marsh improvements and restoration programs are completed.

Units already purchased by the Fish and Wildlife Service that contribute to the welfare of the black duck along the Atlantic coast are numerous. These are all good as far as they go, but the total is far from enough to do the job. There must be more habitat restored and maintained if duck shooting and waterfowl flights are not to become memories. This applies particularly to the black duck. All other game duck populations that now visit the Atlantic coast could be wiped out and there still would be populations of these birds in the interior of the continent which could be used to rebuild the Atlantic coast flight once the adverse conditions that destroyed it were removed.

It is not so with the black duck. With its major breeding ground far to the eastward of the center of abundance of the other species, its fate will be largely determined on the Atlantic coast of this country, in the states that lie from Maine to Georgia. If we cannot build and maintain enough marshland to provide year-round quarters and food for a minimum number of breeding birds and enough additional breeding areas to provide a reasonable shootable crop above that which now exists, the outlook for the black duck is black indeed — much blacker than his plumage.

In the face of this increasingly precarious status of the waterfowl, it is tragic that a few people in Massachusetts were able to slip through a bill to abolish

the Parker River Refuge in the closing days of the last Congress. The Refuge was saved only by President Truman's pocket veto.

Similar legislation may be expected in this session of Congress. In view of the desperate situation, everyone on the Atlantic coast both in and out of Massachusetts who is interested in waterfowl hunting or in seeing waterfowl—particularly the black duck — should oppose such legislation. It is not a local problem. Failure to develop this entire refuge will mean a permanent loss in waterfowl production and waterfowl populations over much of the coast. Parker River, when developed, will provide additional breeding area for black ducks, feed and shelter birds from farther north during both the spring and fall migrations, and provide winter quarters as it does now for other individuals.

A sound program for the black duck will require much work over a long period of time. It will involve as a minimum—

1. More Federal areas, since there are still wide gaps in the chain of major habitat improvement and management areas along the coast, and those interested in the black duck and other Atlantic coast waterfowl are entitled to some of the duck stamp money.

2. Other states could well follow the example of New York, Pennsylvania, and New Jersey in using some of their Pittman-Robertson funds to buy lands and also the example of these and others in increasing the productivity of present marshlands and creating new areas.

3. All future drainage and destruction of marshland should be vigorously combated unless the proposed drainage is clearly necessary in the public interest.

4. Private marshland owners should be encouraged in every way to manage their marshlands to get the greatest value from them. By combining waterfowl and fur-animal needs into a sound management program, marshlands often can produce an attractive return on the capital invested.

5. Better food production and better habitat in all possible areas should be encouraged. The Maine program of planting of both emergent and submerged vegetation in lakes where conditions are suitable might be widely utilized in other states.

Naturally this constructive program should be accompanied by restrictions on shooting sufficient to limit the kill to less than the annual number of ducks put on the wing. This is the only way to increase breeding stocks which can use newly created areas as well as fill any unused places in existing breeding spots. It is also the only way to put more birds on the wing each fall. It takes both ducks and habitat to produce ducks, and man must see that both are available.

Everyone interested in the future of waterfowl, and particularly the black duck, must oppose all movements to destroy existing marshes and work for maximum restoration of all areas that can be restored under present economic conditions. Specifically, this means first—save the Parker River Refuge. This, coupled with a management program to hold the kill well below the annual increase, will bring back the black duck. It has worked for other species of wildlife — it will work in this case.

HUNTING LICENSE SALES SOAR TO ALL-TIME HIGH

The U. S. Fish and Wildlife Service has reported that hunting license sales during the fiscal year ending June 30, 1946, reached an all-time high for the nation. During that period hunters bought 9,854,313 licenses. The previous high was the 8,532,354 bought in 1942. The total revenue from hunting licenses in 1945-46 was $19,805,444.

COURT BREAKS DOWN HUNTERS' RESISTANCE

It doesn't pay to turn down a fish and game protector when he asks for a look at your license, two Anson County hunters learned recently when Protector Paul J. Kiker, Jr., checked them in the field. When the two balked at letting Kiker have a look, he brought charges against them. In Anson Superior Court, where the charges were heard, the two men had to shell out $80.98 for their little campaign of resistance. One paid a $10 fine and $31 costs, and the other paid a $10 fine and $29.98 costs.

EDUCATIONAL SUPERVISOR JOINS STAFF OF DIVISION

L. G. McLean of Raleigh, formerly with N. C. State College as Associate Professor of horticulture in charge of the nursery research program, recently joined the Division of Game and Inland Fisheries as educational supervisor.

Mr. McLean has had wide experience in research and educational work. In 1929 he joined the U. S. Department of Agriculture and was at James Island, S. C., for plant disease studies. In 1931 he was transferred to Texas, working in Greenville and San Antonio on plant and erosion-control studies. He was transferred to Oklahoma to initiate a Soil Conservation Service program of wildlife conservation and erosion control with native plants. He was regional manager for nursery stock production of these plants. He also engaged in studies of native and migratory game birds.

In 1938 he joined the horticultural staff at Oklahoma A. and M. College, in charge of the school's nursery experimental work. He received his bachelor's and master's degrees in plant pathology and botany from that school. He came to State College in 1941.

DIVISION WILL OPERATE TROUT REARING STATION

The Division of Game and Inland Fisheries has taken over the operation of the trout rearing station at Arrowood Glade, Wayah Bald Coöperative Wildlife Management Area. This station is located in the Nantahala National Forest and is owned by the U. S. Forest Service. The station was designed to provide fish for stocking streams in Nantahala National Forest, and was operated prior to the war by the U. S. Fish and Wildlife Service. The station will function as a substation from the Wayesville Hatchery. Clyde Anderson, who has been serving as Acting Superintendent of the Marmon Hatchery at Pineola, is being transferred to the Wayah Bald Station with the title of Assistant Hatchery Superintendent. Fish to be reared at the station will be provided by the U. S. Fish and Wildlife Service Hatchery at Walhalla, South Carolina.

Tar Heel Quail Hunt

By RAYMOND R. CAMP

In *The New York Times*

Larks are larks, sparrows are sparrows, and buzzards are buzzards, but down here quail are "birds," and according to one old counterpart of Uncle Remus who directed us to a place where a covey was "usin'," they'll be here "when dere ain't a drop of balm lef' in Gilead."

And what's more, we found some of them.

We set out this morning with Bob Dixon Perry of Wake Forest, N. C., who, according to Bill Sharpe, "knows the location of almost every covey in Wake and Franklin counties." So we moved off behind Bob's three fine setters, Rex, Dan, and Mutt. The start was not too auspicious, for the past three days have brought unusually low temperatures and high winds. Three such days can do much to change quail habits, and Bog suggested that we "spot hunt" until we found where the birds were feeding. The procedure was to try several places as rapidly as possible and determine the situation by trial and error.

Dogs Find the Birds

The first two areas were barren of birds, although the action of the dogs and the presence of chalk determined that the birds had been there earlier in the morning. Then we tried a field of broom straw, and as we approached the edge of a swampy wood, Dan froze on point and Rex and Mutt backed him perfectly.

The birds flushed twenty feet from the woods and headed for the thick cover. We each dropped one, and we foolishly tried for a double on a bird that was passing through a clump of low pines. We harvested quite a few pine needles, but no quail.

"There are two coveys using the field across the neck of this woods," Bob explained. "No use trying to get any of those singles, and, anyway, that covey is down low enough. Let's try for the others."

This "neck of woods" almost brought our undoing. Midway across there was a small "branch" or brook, which had cut its way sharply through the soil. Although it was only eight or nine feet across, the banks were about five feet high and undercut. Bob leaped across successfully about fifty feet to our right. We withdrew the shells from our gun and leaped.

Doused in the Branch

The distance was right, but the bank was weak, and although we tore out a good-sized sapling in an effort at balance, we wound up on our back in the "branch." When Bob recovered from his hysteria, he helped us to the bank, and we proceeded behind the dogs with water squirting from our boots at each step.

We covered the field thoroughly, and although there was an abundance of food, and plenty of sign that the birds had been there, it was apparent that they had taken to cover.

Then, fifty feet from the woods, a small covey flushed wild, which gave us two more birds. The rest of the covey disappeared in the heavy underbrush and Bob decided any attempt to find singles would be hopeless. Back to the car and off for another area.

During the course of the next two hours we located places which eight different coveys had been using, but with the exception of one more small covey that flushed wild beyond gunshot, we saw no birds.

Twice, while crossing a stretch of heavy cover, we heard birds flush, but the cover was so thick it was impossible to see them. It was especially rough on the dogs, who tried hard to work out fresh scent, but in each instance the birds had gone. I can't figure out what has made them so wild, unless it was the wind.

Later in the afternoon we had better luck. Dan went on point, but before Bob could reach the dog two quail flushed. One angled to the left and the other to the right. Bob made one of the finest doubles we had ever seen, despite the extreme range. Then our turn came, but no double.

We were leg-weary at sundown, but were able to bring six quail back to Bill Sharpe, who said he would "have the toast all ready for them." Although we were rather weary and were under the limit, we can recall no more pleasant day in the field. It would have been worth the day just to watch Dan, Rex, and Mutt work, even though we had failed to pull a trigger.

In the Red

A House special committee reported to Congress and the nation recently that America's wildlife resources "are still in the red" and face "critical times in the years immediately ahead."

"Already the increase in hunting and fishing pressure," the report said, "has been greater than most people expected, even though administrators had generally realized there would be a large increase immediately after the war."

The House Select Committee on Conservation of Wildlife Resources, which was headed by former Representative Robertson, Virginia Democrat, before his election to the Senate, recommended:

1. Greater financial aid for wildlife management.
2. Special emphasis on research in wildlife management.
3. That appropriations for the new fiscal year include grants-in-aid to the states in an amount equal to the current receipts from the special excise tax, and funds for the conservation agencies of the Federal government "in an amount sufficient to enable them to do the increased work expected of them."
4. Stream pollution legislation.
5. Continuation of the House Select Committee on Conservation of Wildlife Resources during the current session of Congress.

In addition, the report repeated recommendations of last year, calling for establishment of additional refuge areas along waterfowl migration routes, and expansion of areas upon which the general public may hunt and fish.

The report said the decline this year in migratory birds "illustrates all too well that we are still in the red in our wildlife resource ledger — there are many more 'steps' to be taken on our journey."

A travel lane of bushy cover (left) for game has just been removed from this site. By contrast, it might have been left to serve game, as in the picture at the right, when feed and cover are badly needed.

SOME BASIC IDEAS

(*Continued from page six*)

greatest dependence upon the improvement of feed and cover and other habitat conditions. Feed and cover must be close together. Frequently farmers and sportsmen feel that there is an abundance of feed for quail when, in fact, the abundance is well out in a large field and so far away from protective cover that quail cannot get to it without being caught by their natural enemies. For example, a Cooper's hawk can catch a flying quail and, therefore, quail simply must stay close to cover. Quail require escape cover, nesting cover, and feeding cover. Feed that is within reach of quail is likely to become very scarce during the late winter. Our greatest efforts in habitat improvement need to be in (1) establishment of plants that will afford feed for quail in late winter, (2) the maintenance of brushy ditch banks, woods edges, etc., for protection. All of these types of cover must of course, be close to each other.

Most of us assume that abandoned farm land, growing up to weeds and brush, is ideal for game. Actually such land is not ideal unless it is given some improvement. Game, we must remember, is a crop of the soil just as surely as are corn, cotton, pigs, and cows, and when the soil becomes so worn out that it will not produce these farm crops, neither will it produce a good game crop. The health of all living things—crops, livestock, game—depends upon the availability of elements from the soil. When the soil becomes depleted of certain elements, living things suffer ill health and become few in numbers. Soil fertility must be rebuilt and maintained as a basic measure in the improvement of hunting. Actually, good farming and good game management must go hand in hand. Only through coöperative effort by sportsmen, farmers, and the State's game agency can good hunting in North Carolina be restored and maintained.

Here is another factor that should not be lost sight of in judging the quality of hunting available now in comparison with earlier times. Many of the best hunters are calling attention to evidence that quail are changing their habits somewhat so that they are now better able to escape from the hunter. Quail seem to be more inclined, after the initial cover flush, to alight again as a compact covey group. Remaining thus perfectly quiet for a time, they give off the minimum of body scent and so foil many good bird dogs and save many of their numbers from being bagged as singles. Also, quail appear to be inhabiting more brushy types of land, making both hunting and shooting more difficult. In these and many other ways game in general is apparently becoming better adapted to survival under modern increased hunting pressure. This idea is supported by biological principle. In part, therefore, the scarcity of quail is likely to be more apparent than real, and better hunting may to some extent depend upon harder hunting, shooting under more severe handicaps, and closer study of the changing ways of quail. After all, we are hunting for sport these days and we should welcome any challenge to our sportsmanship.

The Division of Game and Inland Fisheries is ready to give assistance to sportsmen and farmers who are interested in game restoration. Write us for one or more of the following free publications: *The Wildlife Crop on Your Farm, Farming for Wildlife, Farmer in Town versus Hunter on the Farm, The Farm Boys and Girls Concern with Game.*

We are glad to have sportsmen and farmers write us about their problems and whenever these people have actual areas on which they are endeavoring to practice game management we try to meet with them and give in-the-field advice and assistance.

WOODRUFF IS ASSIGNED TO MARMON HATCHERY

Gwynn Woodruff, who has been serving as Hatchery Assistant at the Roaring Gap Hatchery, is being transferred to the Marmon Hatchery at Pineola as Superintendent. Mr. Woodruff has had several years of experience in fish culture work, and the Division feels he is deserving of this promotion to the new assignment. The transfer is effective as of April 1.

WARM-WATER FISH DISTRIBUTED FROM STATE HATCHERIES DURING 1946

Species	Fayetteville		Marion		Totals	
	Number	Pounds	Number	Pounds	Number	Pounds
Smallmouth Bass: Small Fingerlings	--------	--------	4,800	31	4,800	31
Largemouth Bass: Fry	9,600	Fry	27,000	Fry	36,600	Fry
Small Fingerlings	122,800	667	6,200	87.5	129,000	754.5
Large Fingerlings	225	6	--------	--------	225	6
All Largemouth	132,625	673	33,200	87.5	165,825	760.5
Bluegills: Small Fingerlings	63,750	121	47,600[a]	127.5	111,350	248.5
Large Fingerlings	53	2.5	--------	--------	53	2.5
Adults	50	38	--------	--------	50	38
All Bluegills	63,853	161.5	47,600	127.5	111,453	289
Redbelly (robin): Small Fingerlings	10,000	11	--------	--------	10,000	11
Total All Species	206,478	845.5	85,600	246	292,078	1,091.5

[a] Includes 200 fish produced at the Roaring Gap Hatchery.

TROUT DISTRIBUTED FROM STATE HATCHERIES DURING 1946

Species	Marion[a]		Roaring Gap		Waynesville		Marmon		Totals	
	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Brook: Sm. Fing.	----	----	----	----	8,500	114	500	17.5	9,000	131.5
Med. Fing.	----	----	100	13.0	11,100	832	2,825	151.5	14,025	996.5
Lg. Fing.	7,186	1,244.5	2,835	656	6,350	1,104	7,675	951.5	24,046	3,956
All Brcoks	7,186	1,244.5	2,935	669	25,950	2,050	11,000	1,120.5	47,071	5,084
Rainbow: Sm. Fing.	64,156	365	400	5	----	----	----	----	64,556	370
Med. Fing.	26,778	367	1,400	105.5	4,800	430	2,500	201.5	35,478	1,104
Lg. Fing.	23,433	4,550	6,391	1,119	11,800	2,894	6,700	1,057	48,324	9,620
All Rainbows	114,367	5,282	8,191	1,229.5	16,600	3,324	9,200	1,258.5	148,358	11,094
Brown: Med. Fing.	----	----	----	----	300	34	2,150	114	2,450	148
Lg. Fing.	2,000	318	100	32	2,400	657	4,250	652	8,750	1,659
All Browns	2,000	318	100	32	2,700	691	6,400	766	11,200	1,807
Totals	123,553	6,844	11,226	1,930.5	45,250	6,065	26,600	3,145	206,629	17,985

[a] Includes trout released from Mt. Mitchell station.
Small fingerlings are 1-3 inches in length; medium fingerlings are 3-5 inches in length; large fingerlings are 6 inches and over.

WILDLIFE RESOURCES COMMISSION

(*Continued from page five*)

Warren, Wayne, and Wilson counties.

Fourth District — Bladen, Brunswick, Columbus, Cumberland, Harnett, Hoke, New Hanover, Robeson, Sampson, and Scotland counties.

Fifth District — Alamance, Caswell, Chatham, Durham, Granville, Guilford, Lee, Orange, Person, Randolph, and Rockingham counties.

Sixth District — Anson, Cabarrus, Davidson, Mecklenburg, Moore, Montgomery, Richmond, Rowan, Stanly, and Union counties.

Seventh District — Alexander, Alleghany, Ashe, Davie, Forsyth, Iredell, Stokes, Surry, Watauga, Wilkes, and Yadkin counties.

Eighth District—Avery, Burke, Caldwell, Catawba, Cleveland, Gaston, Lincoln, McDowell, Mitchell, Rutherford, and Yancey counties.

Ninth District — Buncombe, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Macon, Madison, Polk, Swain, and Transylvania counties.

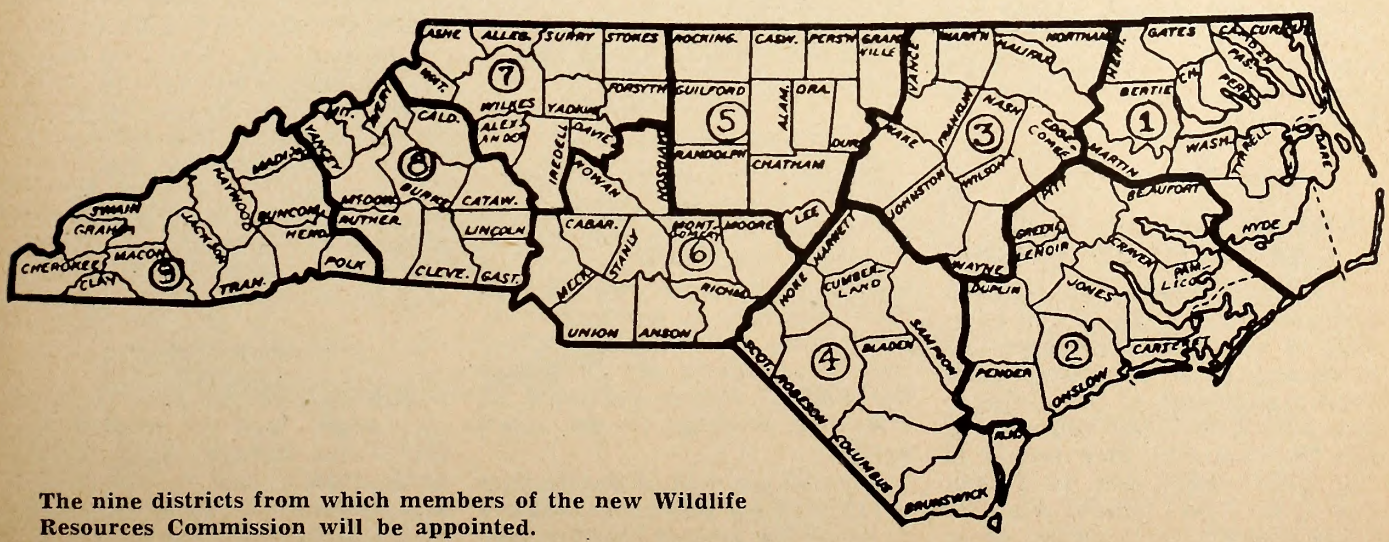
Each member of the Commission shall be an experienced hunter, fisherman, farmer, or biologist, who shall be generally informed on wildlife conservation and restoration problems.

Appointment of Commission. After passage of this Act and on or before the first day of July, 1947, the Governor shall appoint the members of the Commission as follows:

Three members whose terms shall expire on the fourth Tuesday of January, 1949; three members whose terms shall expire on the fourth Tuesday of January, 1951; three members whose terms shall expire on the fourth Tuesday of January, 1953; as the said terms expire, and thereafter, all regular appointments to the Commission shall be for terms of six years each, provided that any member of the Commission appointed pursuant to this Section may be removed by the Governor for cause.

Organization of the Commission The Commission shall hold at least two meetings annually in the City of Raleigh, one in January and one in July, and five members of the Commission shall constitute a quorum for the transaction of business. Additional meetings may be held at such other times and places within the State as may be deemed necessary for the efficient transaction of the business of the Commission. The Commission may hold additional or special meetings at any time at the call of the chairman or on call of any three members of the Commission. The Commission shall determine its own organization and methods of procedure in accordance with the provisions of this Act, and shall have an official seal, which shall be judicially noticed. At the first meeting of the Commission, which shall be held in the City of Raleigh on or before the first day of July, 1947, it shall elect one of its members as chairman and one of its members as vice chairman; thereafter, at the meeting held in January, 1948, and annually thereafter, the Commission shall elect one of its members as chairman and one of its members as vice chairman; such officers to hold office for a period of one year.

Executive Director. The North Carolina Wildlife Resources Commission as soon as practicable after its organization shall select and appoint a competent person qualified as hereinafter set forth as Executive Director of the North Carolina Wildlife Resources Commission. The Executive Director shall be charged with the supervision of all activities under the jurisdiction of the Commission and shall serve as the chief administrative officer of the said Commission. Subject to the approval of the Commission and the Director of the Budget, he is hereby authorized to employ such clerical and other assistants as may be deemed necessary. The person selected as Executive Director shall have had training and experience in conservation, protection, and management of wildlife resources. The salary of such Director shall be fixed by the Governor with the approval of the Commission, and said Director shall be allowed actual expenses incurred while on official duties away from resident headquarters; said salary and expenses to be paid from the Wildlife Resources Fund subject to the provisions of the Executive Budget Act. The term of office



The nine districts from which members of the new Wildlife Resources Commission will be appointed.

of the Executive Director shall be at the pleasure of the Commission. . . . The said Executive Director shall be clothed and vested with all powers, duties, and responsibilities heretofore exercised by the Commissioner of Game and Inland Fisheries relating to Wildlife Resources.

Other Sections. Other sections of the Act do these things:

Transfer to the Wildlife Resources Commission the powers, duties, jurisdiction, and responsibilities of the Department of Conservation and Development relating to wildlife resources, and also lands, buildings, records, equipment, and other properties used by the Department in wildlife resources work, exclusive of commercial fish or fisheries, and except for State Parks and State Forests.

Establish the Wildlife Resources Fund, a special fund in the office of the State Treasurer, which shall be made up of unexpended appropriations for wildlife work, and of subsequent receipts from the sale of hunting, inland fishing, trapping, and related licenses.

Make the Governor the final arbiter of any question arising between the Department of Conservation and Development and the Wildlife Resources Commission as to any duty or responsibility of authority imposed on either by law, or in case of any conflicting rules or regulations or administrative practices adopted by either.

Continue all rules and regulations now in force with respect to wildlife resources as defined by the Act, promulgated by the Department of Conservation and Development under Chapter 113 of the General Statutes, until altered, modified, amended by the Commission, or repealed or modified by law.

UNIFORM DISTRIBUTION COMPLETED BY DIVISION

Distribution of uniforms to fish and game protectors of the Division of Game and Inland Fisheries has been completed. The second shipment of the outfits—half a hundred—was delivered to the Division and then issued to the enforcement men in February, some weeks behind schedule because of the tailor's difficulty in filling the order. A total of 118 district and refuge protectors now are wearing the forest-green uniforms with their black Sam Browne belts and holsters and dark olive drab hats.

THE RACCOON

(*Continued from page seven*)

hunt on the ground, climb trees, and takes impartial interest in their well being. All through autumn and winter, this family life continues.

The coon is a desperate fighter; ask any group that has downed a coon to the dogs. In a single-fight competition a coon will whip a dog of the same weight. And in some instances, three dogs struggle a long time before they overcome their adversary. Man, of course, is his worst enemy.

Reports received throughout the State tell us that this year there are more raccoon in the woods than many people can remember noticing before. In all probability, the release of hunting and trapping pressure during the war has proven beneficial to this animal. But now we must be on our safeguard so as not to abuse the apparent abundance of raccoon today. Let us practice better game management along this line: preventing wild fires in the woods; retention of den trees on our lands; and keeping our dogs and cats penned or tethered. If we can accomplish these three practices, not only the raccoon, but other game as well, will be given a better chance to survive the increasing hunting pressure that is brought to bear upon all wildlife in our great State.

THE SADDEST CHAPTER

By John Martin

In *Southern Otudoors*

The end of another quail season brought the saddest chapter in the history of upland gunning to a close in the South.

From every state which claims that bobwhite is the prince of game birds, and the greatest bird that flies, reports say results of the 1946-47 season indicated an alarming shortage in the quail supply.

Over 95 per cent of the hunters questioned by *Southern Outdoors* reported the poorest hunting they have ever witnessed. A small percentage of these laid the blame on the consistently unsuitable weather conditions — "either too hot; too wet or too cold most of the season."

As a whole, however, hunters appeared convinced that their sport, along with the future of quail, has reached the crossroads.

Reliable information indicates that the ammunition and arms companies are no less concerned about the situation. Duck migrations sounded the first alarm. The shortest flights since 1935 put a scare in manufacturers who supply hunters. This was followed by a dove crop that fell below early expectations.

Then came the climax. All-day quail hunts with proven dogs put few birds in the bag. With few exceptions, quail gunners over the South chalked up all-time lows for season kills.

This has posed a problem for game and fish departments all over the South. It has left them groping for a solution, which becomes more difficult to find every time a hunting license is sold.

Tremendous gains in license sales indicate more and more citizens are turning to the woods and fields for sport and recreation. This calls for an increase, rather than decline, in populations of game birds and animals.

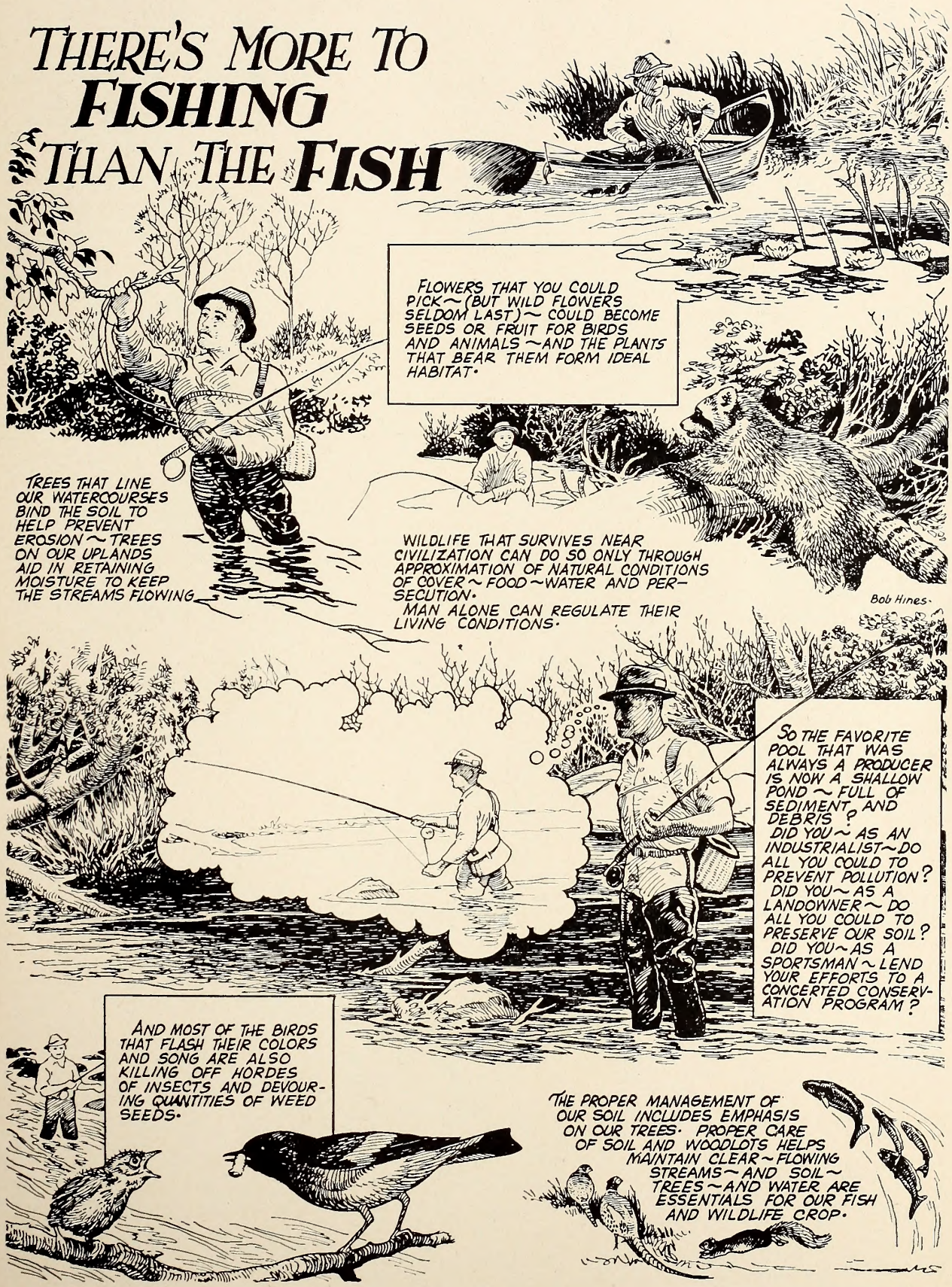
Various plans for saving hunting as a popular sport have been advanced. More will come. But none, so far, has worked.

The drop in game populations threatens to have not only a serious effect on hunting, but also an ultimate far-reaching effect on the sporting goods industry, arms and ammunition companies, and very probably dogs and dog training.

Observers are convinced that a revolutionary educational campaign, a large outlay of funds (from the state or Federal governments, or from private interests), revised game laws and restoration projects by organized sportsmen, all must be combined — immediately — if hunting is to survive as a favored sport for millions.

The eggs of the great horned owl might well be termed the first "cold storage" eggs. These birds usually nest in mid-winter but successfully keep their eggs warm in sub-zero weather.

THERE'S MORE TO FISHING THAN THE FISH



Courtesy *Ohio Conservation Bulletin*

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